

Notice No.2

Rules and Regulations for the Classification of Ships, July 2017

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Please note that corrigenda amends to paragraphs, Tables and Figures are not shown in their entirety.

Issue date: December 2017

Amendments to	Effective date	IACs/IMO implementation (if applicable)
Part 1, Chapter 1, Sections 3 & 5	1 January 2018	N/A
Part 1, Chapter 2, Sections 2 & 3	1 January 2018	N/A
Part 1, Chapter 3, Sections 1, 2, 3, 6, 7, 11, 19 & 24	1 January 2018	1 January 2018
Part 1, Chapter 3, Sections 4, 5, 8, 10 & 14	1 January 2018	N/A



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Part 1, Chapter 1 General Regulations

■ **Section 3** **Technical Committee**

3.1 LR's Technical Committee is at present composed of a maximum of 80 members which includes: LR maintains a Technical Committee, at present comprised of a maximum of 80 members, and additionally an Offshore Technical Committee with specific responsibility for LR's Rules for Offshore Units, at present comprised of a maximum of 80 members. Membership of the Technical Committees includes:

Ex officio members:

- Chairman and Chief Executive Officer of Lloyd's Register Group Limited
- Chairman of the Classification Committee of Lloyd's Register Group Limited

Members Nominated by:

- Technical Committee or Offshore Technical Committee
- Professional bodies representing technical disciplines relevant to the industry
- National and International trade associations with competence relevant to technical issues related to LR's business

3.2 In addition to the foregoing:

- (a) Each National or Area Committee may appoint a representative to attend meetings of the Technical Committees.
- (b) A maximum of five further representatives from National Administrations may be co-opted to serve on the Technical Committees. Representatives from National Administrations may also be elected as members of the Technical Committees as Nominated Members.
- (c) Further persons may be co-opted to serve on the Technical Committees by the relevant Technical Committee.

3.3 All elections are subject to confirmation by the Board.

3.4 The function of the Technical Committees is to consider:

- (a) any technical issues connected with LR's business;
- (b) any proposed alterations in the existing Rules;
- (c) any new Rules for classification;

Where changes to the Rules are necessitated by mandatory implementation of International Conventions and Codes, or Common Rules, Unified Requirements and Interpretations adopted by the International Association of Classification Societies, these may be implemented by LR without consideration by the relevant Technical Committee, although any such changes will may be provided to the Technical Committees for information.

Where changes to the Rules are required by LR to enable existing technical requirements within the Rules to be recognised as Class Notations or Descriptive Notes, these may be implemented by LR without consideration by the relevant Technical Committee, although any such changes will be provided to the relevant Technical Committee for information.

3.5 The term of office of the Chairman and of all members of the each Technical Committee is five years. Members may be re-elected to serve an additional term of office with the approval of the Board. The term of office of the Chairman may be extended with the approval of the Board.

3.6 In the case of continuous non-attendance of a member, the relevant Technical Committee may withdraw membership.

3.7 Meetings of the Technical Committees are convened as often and at such times and places as is necessary, but there is to be at least one meeting in each year. Urgent matters Matters may also be considered by the Technical Committees by correspondence.

3.8 Any proposal involving any alteration in, or addition to the General Regulations, of Rules for Classification is subject to approval of the Board. All other proposals for additions to or alterations to the Rules for Classification other than the General Regulations, will following consideration and approval by the relevant Technical Committee either at a meeting of the that Technical Committee or by correspondence, be recommended to the Board for adoption.

3.9 The Technical Committees is are empowered to:

- (a) appoint sub-Committees or panels; and
- (b) co-opt to the Technical Committee, or to its sub-Committees or panels, representatives of any organisation or industry or private individuals for the purpose of considering any particular problem.

■ **Section 5**
Applicability of Classification Rules and Disclosure of Information

5.1 LR has the power to adopt, and publish as deemed necessary, Rules relating to classification and has (in relation thereto) provided the following:

- (a) Except in the case of a special directive by the Board, no new Regulation or alteration to any existing Regulation relating to classification or to class notations is to be applied to existing ships.
- (b) Except in the case of a special directive by the Board, or where changes necessitated by mandatory implementation of International Conventions, Codes or Unified Requirements adopted by the International Association of Classification Societies are concerned, no new Rule or alteration in any existing Rule is to be applied compulsorily after the date on which the contract between the ship builder and shipowner for construction of the ship has been signed, nor within six months of its adoption. The date of 'contract for construction' of a ship is the date on which the contract to build the ship is signed between the prospective shipowner and the ship builder. This date and the construction number (i.e. hull numbers) of all the vessels included in the contract are to be declared by the party applying for the assignment of class to a newbuilding. The date of 'contract for construction' of a series of sister ships, including specified optional ships for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective shipowner and the ship builder. In this section a 'series of sister ships' is a series of ships built to the same approved plans for classification purposes, under a single contract for construction. The optional ships will be considered part of the same series of sister ships if the option is exercised not later than 1 year after the contract to build the series was signed. If a contract for construction is later amended to include additional ships or additional options, the date of 'contract for construction' for such ships is the date on which the amendment to the contract is signed between the prospective shipowner and the ship builder. The amendment to the contract is to be considered as a 'new contract'. If a contract for construction is amended to change the ship type, the date of 'contract for construction' of this modified vessel, or vessels, is the date on which the revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder. Where it is desired to use existing approved ship or machinery plans for a new contract, written application is to be made to LR. Sister ships may have minor design alterations provided that such alterations do not affect matters related to classification, or if the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the ship builder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to LR for approval. Recognising the long time period that may occur between the initial design contract and the contract for construction for offshore units for fixed locations, the date determining effective classification requirements will be specially considered by LR in such cases.
- (c) All reports of survey are to be made by surveyors authorised by members of the LR Group to survey and report (hereinafter referred to as 'the Surveyors') according to the form prescribed, and submitted for the consideration of the Classification Committee.
- (d) Information contained in the reports of classification and statutory surveys will be made available to the relevant owner, National Administration, Port State Administration, P&I Club, hull underwriter and, if authorised in writing by that owner, to any other person or organisation.
- (e) Notwithstanding the general duty of confidentiality owed by LR to its client in accordance with the LR Rules, LR clients hereby accept that, LR will participate in the IACS Early Warning System which requires each IACS member to provide its fellow IACS members and Associates with relevant technical information on serious hull structural and engineering systems failures, as defined in the IACS Early Warning System (but not including any drawings relating to the ship which may be the specific property of another party), to enable such useful information to be shared and utilised to facilitate the proper working of the IACS Early Warning System. LR will provide its client with written details of such information upon sending the same to IACS Members and Associates.
- (f) Information relating to the status of classification and statutory surveys and suspensions/withdrawals of class together with any associated conditions of class will be made available as required by applicable legislation or court order.
- (g) A Classification Executive consisting of senior members of LR's Classification Department staff shall carry out whatever duties that may be within the function of the Classification Committee that the Classification Committee assigns to it.

Part 1, Chapter 2

Classification Regulations

■ Section 2

Character of classification and class notations

2.1 Definitions

Table 2.2.1 Type notations

Dry cargo	Tanker	Passenger
Anchor handler	Chemical tanker	Passenger ferry
AHTS (Anchor Handler Tug Supply)	Double hull oil tanker	Passenger/vehicle ferry
Barge	Liquefied gas carrier	Passenger ship
Bulk carrier	Liquefied gas tanker	Passenger yacht
Cable laying vessel	Moored oil storage tanker	Roll on-Roll off passenger ferry
Container ship	Moored oil storage unit	Roll on-Roll off passenger ship
Diving support vessel	Oil barge	Sailing passenger ship
Dredger	Oil or bulk carrier	
Escort tug	Oil recovery ship	
Fire fighting	Oil tanker	
Fishing vessel	Ore of oil carrier	
Hopper barge		
Hopper dredger		
Icebreaker		
Icebreaker(+)		
Launch		
Livestock carrier		
Offshore support vessel		
Offshore supply vessel		
Offshore tug		
Offshore well stimulation ship		
Ore carrier		
Pipe laying vessel		
Pontoon		
Reclamation ship		
Refrigerated cargo ship		
Research		
Roll on-Roll off cargo ship		
Seismographic support vessel		
Shipborne barge		
Subsea support vessel		
Standby vessel		
Stern trawler		
Split hopper barge		
Split hopper dredger		
Trawler		
Tug		
Vehicle carrier		

(Part only shown)

Table 2.2.2 Special features notations

Special features notation	Description	See also
LA	Mandatory Lifting Appliance(s). Assigned where the lifting appliance is considered to be an essential feature, e.g. cranes on crane barges, lifting arrangements for diving on diving support ships vessels, and is mandatory	<i>Pt 3, Ch 9, 6 Lifting appliances and support arrangements</i>
LA	Mandatory Lifting Appliance(s). Assigned where the lifting appliance is considered to be an essential feature and has been classed by a recognised classification society other than LR and later transferred into class with LR. In such cases, a new Register of Ship's Lifting Appliances & Cargo Handling Gear (LA.1) will be issued in accordance with LR's <i>Code for Lifting Appliances in a Marine Environment, July 2017</i> .	<i>Pt 3, Ch 9, 6 Lifting appliances and support arrangements</i>
LFPL	Low Flash point flash point liquids. Assigned to offshore supply ships vessels intended	<i>Pt 4, Ch 4 Offshore Support</i>

	for the carriage of liquids with flashpoint below 60°C (closed cup test) in bulk	Vessels
Oil Recovery	Assigned when a ship is equipped for oil recovery operations	<i>Pt 7, Ch 5, 2 Oil recovery</i>
Oil Recovery (F.P. >60°C)	Assigned when a ship is equipped for oil recovery operations restricted to oils with a flash point greater than 60°C	<i>Pt 7, Ch 5, 2 Oil recovery</i>

2.1.13 Laid-up notation. A ship not under repair or not actively employed may be assigned the laid-up notation in order to maintain the ship in class subject to agreement by the Classification Committee. A general examination of the hull and machinery is to be carried out in lieu of the Annual Survey. An Underwater Examination (UWE) is to be carried out in lieu of the Special Survey. See *Pt 1, Ch 3, 1.1 Frequency of surveys 1.1.2, Pt 1, Ch 3, 2.1 General 2.1.5, Pt 1, Ch 3, 5.1 General 5.1.6* and *Pt 1, Ch 3, 11.1 Annual, Intermediate and Decking Bottom Surveys 11.1.2*.

2.4 Class notations (machinery)

(Part only shown)

2.4.1 The following class notations are associated with the machinery construction and arrangement, and may be assigned as considered appropriate by the Classification Committee:

[x]LMC This notation will be assigned when:

- other items of machinery and gearing arrangements for propulsion and electrical power generation and other auxiliary machinery for essential services are in compliance with LR Rules and supplied with the Manufacturer's certificate, see. This notation is assigned subject to the conditions in *Pt 1, Ch 2, 2.9 Application notes 2.9.2* being complied with.

MCH This notation will be assigned when the:

- propelling and essential auxiliary machinery has been supplied with a Manufacturer's certificate, see. This notation is assigned subject to the conditions in *Pt 1, Ch 2, 2.9 Application notes 2.9.3* being complied with.

2.7 Class notations (Environmental Protection)

2.7.1 The following class notations are associated with the design and operation of a ship and may be assigned as considered appropriate by the Classification Committee, on application from the Owners:

ECO This notation will be assigned when a ship is designed and operated in accordance with the relevant requirements of the Rules.

ECO(TOC) This notation will be assigned when the environmental protection arrangements are in accordance with the requirements of another recognised classification society and are essentially equivalent to Rule requirements and the ship is operated in accordance with the relevant requirements of the Rules.

UWN-M This notation will be assigned where a vessel has had its underwater radiated noise measured and certified in accordance with LR's *ShipRight Procedure Additional Design and Construction Procedure for the Determination of a Vessel's Underwater Radiated Noise*.

UWN-L() This notation will be assigned where a vessel has had its underwater radiated noise measured and certified in accordance with LR's *ShipRight Procedure Additional Design and Construction Procedure for the Determination of a Vessel's Underwater Radiated Noise* and the profile of the underwater radiated noise curve(s) are found to be less than the limits contained in the ShipRight Procedure. The parentheses are to contain the limit set in accordance with the ShipRight Procedure and listed therein.

■ Section 3 Surveys – General

3.5 Existing ships – Periodical Surveys

3.5.3 The Owner should notify LR whenever a ship can be examined in dry-dock or on a slipway. A minimum of two *Decking Bottom Surveys* are to be held in each five-year Special Survey period and the maximum interval between successive *Decking Bottom Surveys* is not to exceed three years. One of the two *Decking Bottom Surveys* required in each five-year period is to coincide with the Special Survey. Consideration may be given in exceptional circumstances to an extension of the *Decking Bottom Survey*, not exceeding three months, provided the interval between successive surveys does not exceed 36 months. A definition of 'exceptional circumstances' is given in *Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.9*. The Classification Committee may accept an *In-water Survey* in lieu of the intermediate docking between Special Surveys, see *Pt 1, Ch 3, 4.3 In-water Surveys*.

A Bottom Survey is an examination of the outside of the ship's bottom and related items, and is normally to be carried out with the ship in dry-dock. However, the Classification Committee may give consideration to alternate examination while the ship is afloat as an *In-Water Survey*, subject to provisions of *Pt 1, Ch 3, 4.3 In-Water Surveys*. An *In-water In-Water Survey* shall not be permitted for ships of 15 years of age and over that are assigned the notation **ESP**.

For general dry cargo ships, for gas carriers and for ships with class notation **ESP**, the Bottom Survey in conjunction with the Special Survey must be carried out with the ship in dry-dock.

For ships over 15 years of age, with the class notation **ESP**, the Bottom Survey is to be held in dry-dock; in addition, a Bottom Survey in dry-dock is to be held as part of the Intermediate Survey.

Bottom Surveys are to be carried out in accordance with the requirements of *Pt 1, Ch 3, 4 Bottom Surveys – In Dry-Dock and In-Water - Hull and machinery requirements*.

A Decking Bottom Survey is considered to coincide with the Special Survey when held within the 15 months prior to the due date of the Special Survey.

Where the Special Survey of the hull is carried out on a Continuous Survey basis, as given in Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.14, the survey in water Dry-Dock may be held at any time within the five-year cycle.

3.5.4 The interval between dry dockings Bottom Surveys for ships operating in fresh water and for certain non-self-propelled craft may be greater than that given in Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.3.

3.5.6 The date of the last examination in dry dock or on a slipway Bottom Survey will be recorded on the Class Direct website.

3.5.7 As an alternative to Annual Surveys and Decking Bottom Surveys, according to Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.1 and Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.3 respectively, ships classed '100A1 shipborne barge' may be subjected to Intermediate Surveys. These surveys become due 30 months after the previous Special Survey. The survey is to be in accordance with the requirements given in Pt 1, Ch 3, 2 Annual Surveys - Hull and machinery requirements, as applicable. Intermediate Surveys are to be completed within three months of the due date.

3.5.8 Survey requirements for In-water In-Water Surveys are given in Pt 1, Ch 3, 4.3 In-water In-Water Surveys. The date of the last In-water In-Water Survey will be recorded on the Class Direct website.

3.5.10 Where, on shipborne barges, Intermediate Surveys are permitted as an alternative to Annual and Decking Bottom Surveys, Special Surveys become due five years after the previous Special Survey.

Part 1, Chapter 3 Periodical Survey Regulations

■ Section 1 General

1.1 Frequency of surveys

1.1.1 The requirements of this Chapter are applicable to the Periodical Surveys set out in Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys. Except as amended at the discretion of the Committee, the periods between such surveys are as follows:

- (a) Annual Surveys, as required by Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.1.
- (b) Intermediate Surveys, as required by Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.2.
- (c) Decking Bottom Surveys, as required by Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.3 and Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.4.
- (d) When ships classed 100A1 shipborne barge are subjected to Intermediate Surveys, those surveys become due 30 months after the previous Special Survey, see Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.7.
- (e) Special Surveys at five-yearly intervals, see Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.9. For alternative arrangements, see also Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.10, Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.11, Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.12 and Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.14.
- (f) Complete Surveys of machinery at five-yearly intervals, see Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.18.

1.1.2 For ships assigned the notation 'laid-up', in order to maintain the ship in class a general examination of the hull and machinery is to be carried out in lieu of the Annual Survey and an Underwater Examination (UWE) is to be carried out in lieu of the Special Survey, see Pt 1, Ch 3, 2.1 General 2.1.5, Pt 1, Ch 3, 5.1 General 5.1.6 and Pt 1, Ch 3, 11.1 Annual, Intermediate and Decking Bottom Surveys 11.1.2.

1.5 Definitions

(Part only shown)

1.5.22 For the application of requirements outlined in Sections Pt 1, Ch 3, 2 Annual Surveys - Hull and machinery requirements, Pt 1, Ch 3, 3 Intermediate Surveys - Hull and machinery requirements, Pt 1, Ch 3, 4 Decking Bottom Surveys – In Dry-Dock and In-water Surveys In-Water - Hull and machinery requirements and Pt 1, Ch 3, 5 Special Survey - General - Hull requirements, a general dry cargo ship is a self-propelled ship of 500 gross tonnes or above, constructed generally with a 'tween deck and intended to carry solid cargoes, other than:

1.5.32 A Natural-gas fuel installation fuel installation using gases or other low-flashpoint fuels comprises the following; fuel bunkering, fuel storage, fuel processing and fuel delivery to gas fuelled consumers. The scope of the natural-gas such a fuel installation extends from the bunker manifold to the natural-gas fuelled consumer and includes any re-liquefaction plant and compressors that are fitted to manage boil off. These installations may be on board any ship type referred to in this Chapter except gas carriers as defined in Pt 1, Ch 3, 1.5 Definitions 1.5.8.

1.6 Preparation for survey and means of access

1.6.16 For **natural-gas fuel installations** a fuel installation using **gases or other low-flashpoint fuels** see also Pt 1, Ch 3, 24.1 General.

1.9 Documentation

1.9.2 In addition to the above, for CSR oil tankers and CSR bulk carriers subject to SOLAS - *International Convention for the Safety of Life at Sea Chapter II-1 - Construction - Structure, subdivision and stability, machinery and electrical installations Part A-1 - Structure of ships Regulation 3-10 – Goal-based ship construction standards for bulk carriers and oil tankers*, a Goal Based Standard (GBS) Ship Construction File (SCF) as required therein, limited to the items to be retained on board, is to be available on board. is to be provided in accordance with the requirements of Pt 4, Ch 7, 1.6 Information required for CSR bulk carriers 1.6.4 and Pt 4, Ch 9, 1.6 Information required for CSR Double Hull Oil Tankers 1.6.4. Certain important GBS SCF information must be retained aboard the ship. The remainder may be kept ashore as a 'GBS SCF' Supplement Ashore in an on-shore Archive Centre.

1.9.3 For CSR oil tankers and CSR bulk carriers subject to SOLAS - *International Convention for the Safety of Life at Sea Chapter II-1 - Construction - Structure, subdivision and stability, machinery and electrical installations Part A-1 - Structure of ships Regulation 3-10 – Goal-based ship construction standards for bulk carriers and oil tankers*, the Owner is to arrange the updating of the information contained in the GBS SCF throughout the ship's life at any major event, including, but not limited to, substantial repair, conversion or modification to the ship structure whenever a modification of the documentation included in the SCF has taken place. Documented procedures for updating the GBS SCF are to be included within the Safety Management System.

1.9.4 The applicable documentation is to be kept on board for the lifetime of the ship and is to be readily available for the Surveyor.

■ Section 2 Annual Surveys - Hull and machinery requirements

2.2 Annual Surveys

2.2.23 On ships fitted with a dynamic positioning system, the control system and associated machinery items are to be generally examined and tested to demonstrate that they are in good working order. For ships classed with **DP (AA)** or **DP (AAA)** notations Surveyors are to review records of the annual testing to confirm the ship's ability to keep position after single failures of any component or system and, in addition, Surveyors are to witness testing conducted alongside as far as is practicable.

2.2.45 For **natural-gas fuel installations** a fuel installation using **gases or other low-flashpoint fuels** see also Pt 1, Ch 3, 24.3 Annual Surveys – General Requirements for Fuel Systems to Pt 1, Ch 3, 24.6 Annual Survey - Fuel Bunkering System.

2.2.46 Where a Ballast Water Treatment System (BWTS) is installed, a general examination is to be carried out to ascertain that the BWTS is being maintained in good working order. This is to include examination and testing of safety/protective devices, the fixed fire detection and alarm system(s) and, where fitted, the gas detection and alarm system(s) and associated BWTS emergency shutdown devices. The ventilation arrangements of the space in which Ballast Water Treatment System (BWTS) is fitted are to be examined under operating conditions as far as practicable. At the time of the Annual Survey the operational and maintenance records are to be made available to the attending Surveyor to verify the satisfactory operation of the BWTS and associated safety devices/systems.

■ Section 3 Intermediate Surveys - Hull and machinery requirements

3.2 Review of documentation on board

3.2.2 For CSR oil tankers and CSR bulk carriers subject to SOLAS - *International Convention for the Safety of Life at Sea Chapter II-1 - Construction - Structure, subdivision and stability, machinery and electrical installations Part A-1 - Structure of ships Regulation 3-10 – Goal-based ship construction standards for bulk carriers and oil tankers*, on completion of the survey, the surveyor is to verify that the update of the Ship Construction File (SCF) has been done whenever a modification of the documentation included in the SCF has taken place. the Surveyor is to examine the information held in the Goal Based Standard (GBS) Ship Construction File (SCF) stored on board the ship. On completion of the survey, in the case of any major event, including, but not limited to, substantial repair, conversion or any modification to the ship structure, the Surveyor is to verify that the information stored on board of the ship has been updated, and is to verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the GBS SCF list of materials.

3.2.3 For CSR oil tankers and CSR bulk carriers subject to SOLAS - *International Convention for the Safety of Life at Sea Chapter II-1 - Construction - Structure, subdivision and stability, machinery and electrical installations Part A-1 - Structure of ships Regulation 3-10 – Goal-based ship construction standards for bulk carriers and oil tankers*, on completion of the survey, the surveyor is to verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the SCF list of materials for the GBS SCF Supplement Ashore, the Surveyor is to verify the information stored in the Archive Centre by examining the list of information included in the Supplement Ashore. In addition, the Surveyor is to confirm that the service contract with the Archive Centre remains valid. In the case of any major event, including, but not limited to, substantial repair, conversion or modification to the ship's

structure, the Surveyor is to verify that the information stored in the Archive Centre has been updated by examining the list of updated information included in the Supplement Ashore.

3.3 Intermediate Surveys

3.3.21 For **ship-borne barges**, where Intermediate Surveys are permitted as an alternative to Annual Surveys and Decking Bottom Surveys, all the hatch covers are to be hose tested at every survey. The external surfaces of the barges are to be surveyed at these surveys.

3.3.23 For **natural gas fuel installations** a fuel installation using **gases or other low-flashpoint fuels** see also Pt 1, Ch 3, 24.7 **Intermediate Surveys**.

■ Section 4

Decking Bottom Surveys – In Dry-Dock and In-water Surveys In-Water - Hull and machinery requirements

4.1 General

4.1.1 At **Decking Bottom Surveys or In-water Surveys** the Surveyor is to examine the ship and machinery, so far as necessary and practicable, in order to be satisfied as to the general condition.

4.1.2 For **oil tankers** (including ore/oil and ore/bulk/oil ships), **chemical tankers** and **bulk carriers** over 15 years of age the intermediate docking between Special Surveys is to be held in dry dock. Further, this survey is to be held as part of the Intermediate Survey.

4.2 **Decking Surveys** Bottom Surveys in Dry-Dock

4.2.1 Where a ship is in dry-dock or on a slipway it is to be placed on blocks of sufficient height, and proper staging is to be erected as may be necessary, for the examination of the shell including bottom and bow plating, keel, stern, sternframe and rudder. **The rudder is to be lifted for examination of the pintles if considered necessary by the Surveyor.**

4.2.3 Visible parts of the rudder, rudder pintles, rudder stocks and couplings and stern frame are to be examined. The pintles are to be examined either by removal of the inspection plates, or if considered necessary by the Surveyor, the rudder is to be lifted to enable examination. The clearances in the rudder bearings are to be measured. Where applicable, pressure testing of the rudder may be required if deemed necessary by the Surveyor.

4.2.4 The **sea chests**, sea connections, scuppers and sanitary discharges, their attachments to the hull and the gratings at the sea inlets are to be examined.

4.2.5 **The propeller, sternbush and sea connection fastenings and the gratings at the sea inlets are to be examined.** Visible parts of the propeller(s) and sternbush(es) are to be examined. The clearance in the sternbush and the efficiency of the oil gland, if fitted, are to be ascertained and recorded. For controllable pitch propellers, the Surveyor is to be satisfied with the fastenings and tightness of hub and blade sealing.

4.2.7 **The clearance in the sternbush and the efficiency of the oil glands are to be ascertained.**

Existing paragraphs 4.2.8 and 4.2.9 have been renumbered 4.2.7 and 4.2.8.

4.2.10 **Where the antifouling system is changed completely, or partial repair is carried out affecting 25 per cent or more of the antifouling system, the coating specification and antifouling system is to be examined by the Surveyor in accordance with IMO Antifouling System Convention.**

4.2.9 To maintain an ***IWS** notation, at completion of each dry-docking the condition of the high resistance paint is to be confirmed and, as applicable, satisfactory access arrangements to take the sternbush clearance and rudder pindle/bearing clearances are to be verified.

4.3 **In-water** In-Water Surveys

4.3.1 The Committee will accept an **In-water** In-Water Survey in lieu of the intermediate docking between Special Surveys required in a five year period at alternate Bottom Surveys on ships other than those precluded covered in Pt 1, Ch 3, 4.1 General 4.1.2 Pt 1, Ch 2, 3.5 Existing ships – Periodical Surveys 3.5.3 and where an ***IWS** notation is assigned, see Pt 1, Ch 2, 2.3 Class notations (hull) 2.3.11.

4.3.2 The Committee may accept an **In-water** In-Water Survey in lieu of the intermediate docking between Special Surveys required in a five year period at alternate Bottom Surveys on ships where suitable protection is applied to the underwater portion of the hull. If requested, and providing that there is suitable access for the taking of rudder pindle and bush clearances and for verifying the security of pintles in their sockets while the vessel is afloat, an ***IWS** notation may be assigned on satisfactory completion of the Survey, provided that the applicable requirements of LR's Rules and Regulations are complied with, see also Pt 1, Ch 2, 2.3 Class notations (hull) 2.3.11.

4.3.3 The In-water In-Water Survey is to provide the information normally obtained from the Decking Bottom Survey in dry-dock. However, for oil lubricated sternbush arrangements, the clearance in the sternbush is not required to be ascertained subject to the Surveyor confirming satisfactory operating history and condition data records (lubricating oil analysis, bearing temperature, lubricating oil consumption) and verifying satisfactory operation of the screwshaft.

4.3.4 When there is no access, special consideration shall be given to ascertaining rudder bearing clearances and sternbush clearances of water lubricated bearings based on a review of the operating history, on board testing and stern bearing oil analysis condition data. These considerations are to be included in the proposals for In-water In-Water Surveys which are to be submitted in advance of the survey being required, so that satisfactory arrangements can be agreed with LR.

4.3.5 The In-water In-Water Survey is to be carried out at an agreed geographical location under the surveillance of a Surveyor to LR, with the ship at a suitable draught in sheltered waters and with weak tidal streams and currents. The in-water visibility and the cleanliness of the hull below the waterline is to be clear enough to permit a meaningful examination which allows the Surveyor and diver to determine the condition of the plating, appendages and the welding. The Surveyor is to be satisfied that the method of pictorial presentation is satisfactory. There is to be good two-way communication between the Surveyor and the diver. The Surveyor is to be satisfied with the methods of orientation of the divers on the plating, which should make use where necessary of permanent markings on the plating at selected points.

4.3.6 Prior to commencing the In-water In-Water Survey, the equipment and procedures for both observing and reporting the survey are to be agreed between the Owners, the Surveyor and the diving firm.

4.3.7 The In-water In-Water Survey is to be carried out by a qualified diver employed by a firm approved by LR. In addition, for certain aspects of the In-water In-Water Survey, consideration may be given to the use of a Remotely Operated Vehicle (ROV) operated by the LR approved firm.

4.3.8 The Surveyor is to be satisfied that the method of pictorial presentation is satisfactory. There is to be good two-way communication between the Surveyor and the diver.

4.3.9 If the In-water In-Water Survey reveals damage or deterioration that requires early attention, the Surveyor may require that the ship be dry-docked in order that a fuller survey can be undertaken and the necessary work carried out.

4.3.10 Some National Administrations may have requirements additional to those of Pt 1, Ch 3, 4.3 In-water Surveys 4.3.1 to Pt 1, Ch 3, 4.3 In-water Surveys 4.3.9.

■ **Section 5** **Special Survey - General - Hull requirements**

5.1 General

5.1.4 A Decking Bottom Survey in accordance with the requirements of Pt 1, Ch 3, 4 Decking Bottom Surveys – In Dry-Dock and In-water Surveys In-Water - Hull and machinery requirements is to be carried out as part of the Special Survey.

5.1.5 During the Decking Bottom Survey, for general dry cargo ships, oil tankers (including ore/oil ships and ore/bulk/oil ships), chemical tankers and bulk carriers, the overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the cargo spaces and ballast tanks are to be carried out as required, if not already surveyed.

■ **Section 6** **Special Survey - Bulk carriers - Hull requirements**

6.1 General

6.1.1 The requirements of Pt 1, Ch 3, 2 Annual Surveys - Hull and machinery requirements, Pt 1, Ch 3, 4 Decking Bottom Surveys – In Dry-Dock and In-water Surveys In-Water - Hull and machinery requirements and Pt 1, Ch 3, 5 Special Survey - General - Hull requirements are to be complied with as applicable.

6.2 Review of documentation on board

6.2.2 For CSR Bulk carriers subject to SOLAS - International Convention for the Safety of Life at Sea Chapter II-1 - Construction - Structure, subdivision and stability, machinery and electrical installations Part A-1 - Structure of ships Regulation 3-10 – Goal-based ship construction standards for bulk carriers and oil tankers, on completion of the survey, the surveyor is to verify that the update of the Ship Construction File (SCF) has been done whenever a modification of the documentation included in the SCF has taken place. The Surveyor is to examine the information held in the Goal Based Standard (GBS) Ship Construction File (SCF) stored on board the ship. On completion of the survey, in the case of any major event, including, but not limited to, substantial repair, conversion or any

modification to the ship structure, the Surveyor is to verify that the information stored on board of the ship has been updated, and is to verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the GBS SCF list of materials.

6.2.3 For CSR bulk carriers subject to SOLAS - *International Convention for the Safety of Life at Sea Chapter II-1 - Construction - Structure, subdivision and stability, machinery and electrical installations Part A-1 - Structure of ships Regulation 3-10 – Goal-based ship construction standards for bulk carriers and oil tankers*, ~~on completion of the survey, the surveyor is to verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the SCF list of materials~~ for the GBS SCF Supplement Ashore, the Surveyor is to verify the information stored in the Archive Centre by examining the list of information included in the Supplement Ashore. In addition, the Surveyor is to confirm that the service contract with the Archive Centre remains valid. In the case of any major event, including, but not limited to, substantial repair, conversion or modification to the ship's structure, the Surveyor is to verify that the information stored in the Archive Centre has been updated by examining the list of updated information included in the Supplement Ashore.

■ **Section 7 Special Survey - Oil tankers (including ore/oil ships and ore/bulk/oil ships) - Hull requirements**

7.1 General

7.1.1 The requirements of *Pt 1, Ch 3, 2 Annual Surveys - Hull and machinery requirements, Pt 1, Ch 3, 4 Decking Bottom Surveys – In Dry-Dock and In-water Surveys In-Water - Hull and machinery requirements* and *Pt 1, Ch 3, 5 Special Survey - General - Hull requirements* are to be complied with as applicable.

7.2 Review of documentation on board

7.2.2 For CSR oil tankers subject to SOLAS - *International Convention for the Safety of Life at Sea Chapter II-1 - Construction - Structure, subdivision and stability, machinery and electrical installations Part A-1 - Structure of ships Regulation 3-10 – Goal-based ship construction standards for bulk carriers and oil tankers*, ~~on completion of the survey, the surveyor is to verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the SCF list of materials~~ for the GBS SCF Supplement Ashore, the Surveyor is to verify the information stored in the Archive Centre by examining the list of information included in the Supplement Ashore. In addition, the Surveyor is to confirm that the service contract with the Archive Centre remains valid. In the case of any major event, including, but not limited to, substantial repair, conversion or any modification to the ship structure, the Surveyor is to verify that the information stored on board of the ship has been updated and is to verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the GBS SCF list of materials.

7.2.3 For CSR oil tankers subject to SOLAS - *International Convention for the Safety of Life at Sea Chapter II-1 - Construction - Structure, subdivision and stability, machinery and electrical installations Part A-1 - Structure of ships Regulation 3-10 – Goal-based ship construction standards for bulk carriers and oil tankers*, ~~on completion of the survey, the surveyor is to verify any addition and/or renewal of materials used for the construction of the hull structure are documented within the SCF list of materials~~ for the GBS SCF Supplement Ashore, the Surveyor is to verify the information stored in the Archive Centre by examining the list of information included in the Supplement Ashore. In addition, the Surveyor is to confirm that the service contract with the Archive Centre remains valid. In the case of any major event, including, but not limited to, substantial repair, conversion or modification to the ship's structure, the Surveyor is to verify that the information stored in the Archive Centre has been updated by examining the list of updated information included in the Supplement Ashore.

■ **Section 8 Special Survey - Chemical Tankers - Hull requirements**

8.1 General

8.1.1 The requirements of *Pt 1, Ch 3, 2 Annual Surveys - Hull and machinery requirements, Pt 1, Ch 3, 4 Decking Bottom Surveys – In Dry-Dock and In-water Surveys In-Water - Hull and machinery requirements* and *Pt 1, Ch 3, 5 Special Survey - General - Hull requirements* are to be complied with as applicable.

- **Section 10**
Dredgers, hopper dredgers, sand carriers, hopper barges and reclamation craft
- 10.1 **General**
 - 10.1.1 The requirements of this Section are to be complied with, as applicable, in addition to the survey requirements of Pt 1, Ch 3, 2 *Annual Surveys - Hull and machinery requirements*, Pt 1, Ch 3, 3 *Intermediate Surveys - Hull and machinery requirements*, Pt 1, Ch 3, 4 *Decking Bottom Surveys – In Dry-Dock and In-water Surveys In-Water - Hull and machinery requirements* and Pt 1, Ch 3, 5 *Special Survey - General - Hull requirements*. Where surveys are required on dredging or hopper equipment such as gantries, bottom doors and their operating gear, positioning spuds and suction pipe attachments or split hull devices such as actuating and locking devices, these will be limited to the extent considered necessary by the Surveyor to satisfy himself that their condition or malfunction will not adversely affect the ship's structure.
 - 10.1.2 Where applicable, the **Decking Bottom Survey** is to include the examination of hopper doors and their fittings, and of hopper valves.
- **Section 11**
Machinery surveys - General requirements
 - 11.1 **Annual, Intermediate and Decking-Bottom Surveys**
 - 11.1.1 For Annual, Intermediate and **Decking Bottom Surveys**, see Pt 1, Ch 3, 2 *Annual Surveys - Hull and machinery requirements*, Pt 1, Ch 3, 3 *Intermediate Surveys - Hull and machinery requirements* and Pt 1, Ch 3, 4 *Decking Bottom Surveys – In Dry-Dock and In-water Surveys In-Water - Hull and machinery requirements*.
 - 11.2 **Complete Surveys**
 - 11.2.12 For **natural gas fuel installations** a fuel installation using **gases or other low-flashpoint fuels** see also Pt 1, Ch 3, 24.8 *Complete Surveys – General requirements* and Pt 1, Ch 3, 24.9 *Complete Surveys – Natural gas fuelled consumers and other equipment*.
- **Section 14**
Electrical equipment
 - 14.3 **Decking Bottom Surveys**
- **Section 19**
Inert gas systems
 - 19.2 **Scope of surveys**
 - 19.2.5 See Pt 1, Ch 3, 24.3 *Annual Surveys – General Requirements for Fuel Systems* 24.3.5 and Pt 1, Ch 3, 24.7 *Intermediate Surveys* 24.7.1 for inert gas systems on ships with **natural gas fuel installations** a fuel installation using **gases or other low-flashpoint fuels**.
- **Section 24**
Natural gas fuel Installations Fuel installations using gases or other low-flashpoint fuels
 - 24.1 **General**
 - 24.1.3 This Section provides requirements for the survey of **natural gas fuel installations** a fuel installation using **gases or other low-flashpoint fuels** as defined in Pt 1, Ch 3, 1.5 *Definitions* 1.5.32 (**natural gas** is **gases or other low-flashpoint fuels** are hereinafter referred to as **fuel**).
 - 24.1.5 The Annual Survey **should** shall be scheduled, if possible as far as practicable, to coincide with a bunkering operation to allow for verification of fuel storage tank level alarms and bunkering control, alert and safety systems under operational conditions. At annual survey physical testing of alarms and shutdowns is not required unless it is considered necessary by the attending Surveyor. In any case records of the alarms are to be retained for the verification of the attending Surveyor.
 - 24.1.7 The extent of the testing required for Complete Surveys will normally be such that the full survey cannot be carried out with the fuel installation operating or loaded with fuel. Consequently, aspects of the survey **should** shall be coordinated to correspond with dry-docking or another period when the system will be gas free. Completion of the survey requires verification of satisfactory condition of the installation at the normal operating temperatures and pressures so will normally be completed once the vessel has been bunkered following reactivation of the system.

24.1.12 Where the design of any part of the ~~natural gas fuel system~~ installation does not permit opening up for internal examination, as required by these regulations, alternative arrangements for testing and/or inspection will be specially considered.

24.3 Annual Surveys – General Requirements for Fuel Systems Installations

24.3.2 The ship's log and operational records ~~for the fuel installation~~, covering the period from the previous survey, are to be examined. Any malfunction of the installation recorded in the log is to be investigated. It is to be verified that any repairs have been carried out to an acceptable standard and in accordance with the applicable Rules and Regulations, with regard to correct functioning of the gas detection systems, fuel supply/gas systems, and other equipment related to the fuel installation. The operating hours per day of the reliquefaction plant, the gas combustion unit, as applicable, the boil-off rate, and nitrogen consumption (for membrane containment systems) are to be reviewed and evaluated for equivalence on the balance of the fuel handling, and considered together with any existing gas detection records.

24.3.3 Any malfunction of the installation recorded in the log is to be investigated. It is to be verified that any repairs have been carried out to an acceptable standard and in accordance with the applicable Rules and Regulations.

24.3.4 The manufacturer/Builder instructions and manuals covering the operations, safety and maintenance requirements and occupational health hazards relevant to fuel storage, fuel bunkering, and fuel supply and associated systems for the use of the fuel, are to be confirmed as being aboard the vessel.

(Part only shown)

24.3.3 24.3.5 ~~Control, alert and safety systems are to be surveyed~~ All control systems, alerts and safety systems are to be tested as follows:

(b) All control, alerts and safety systems are to be tested, where testing is not ~~possible~~ practicable due to operational reasons simulated testing may be accepted by the attending Surveyor. Which These are to include but are not limited to:

(c) Gas detection and other leakage detection equipment in spaces containing fuel storage, fuel bunkering, and fuel supply equipment or components or associated systems, including indicators and alarms, is to be confirmed as being in satisfactory operating condition. Recalibration of the gas detection systems shall be verified in accordance with the manufacturers' recommendations.

Existing listed items (c) to (e) have been renumbered (d) to (f).

(g) Verification, as far as is practicable, of the satisfactory operation of the control, monitoring and automatic shutdown systems of the fuel supply and bunkering systems.

(h) Operational test, as far as practicable, of the shutdown of ESD protected machinery spaces.

(Part only shown)

24.3.4 24.3.6 Fuel installations are to be surveyed as follows:

(d) Fuel piping and components associated with the fuel processing equipment are to be visually examined.

24.3.5 24.3.7 Inerting arrangements and associated alarms are to be verified as being in satisfactory condition, including the means for prevention of backflow of fuel vapour to the inert gas system.

(Part only shown)

24.3.6 24.3.8 Ventilation systems including portable ventilating equipment where fitted, for spaces containing fuel storage, fuel bunkering, and fuel supply units or components, or associated systems, including air locks, pump rooms, compressor rooms, fuel preparation rooms, fuel valve rooms, control rooms and spaces containing gas burning equipment, are to be surveyed as follows:

(d) ~~Fuel piping and components associated with the fuel processing equipment are to be visually examined~~. Where alarms, such as differential pressure and loss of pressure alarms, are fitted, these shall be operationally tested as far as practicable.

Existing paragraphs 24.3.7 to 24.3.11 have been renumbered 24.3.9 to 24.3.13.

24.3.14 Electrical equipment and bulkhead/deck penetrations, including access openings in hazardous areas, are to be examined for continued suitability for their intended service and installation area.

24.3.15 Electrical bonding arrangements in hazardous areas, including bonding straps where fitted, are to be examined.

24.4 Annual Surveys – Fuel Processing Equipment

(Part only shown)

24.4.1 The following fuel processing equipment is to be generally examined in working condition and operational parameters verified. Insulation, where fitted, need not be removed but any deterioration of insulation, or evidence of dampness which could lead to external corrosion of the vessels or their connections, is to be investigated:

(b) ~~Natural gas fuel~~ Fuel heaters, vaporisers, masthead heaters.

(Part only shown)

24.4.3 The condition of the fuel isolation valve and double block and bleed arrangements for each consumer is to be examined with respect to:

(c) General examination to confirm that the valve arrangement and all associated fuel monitoring, and control, and shutdown equipment are in satisfactory condition. The external examination is to be supplemented by a review of relevant operational, maintenance and service reports.

24.4.5 Records of testing the operation of the tank master isolation valve master fuel valve for each engine space are to be verified. Tests are to be carried out on regular basis as agreed with LR and the scope of the testing should shall incorporate a full test of the Emergency Shutdown sequence. Where possible practicable, operation of the valve as described above is to be witnessed at the time of survey.

24.5 Annual Surveys – Fuel Storage

24.5.2 For Type C pressurised fuel storage tanks the external surface of the fuel storage tank insulation is to be visually examined for cold spots to verify the condition of the insulation arrangements. This examination is to be carried out with the fuel storage tanks loaded. Ideally fuel storage tanks should shall be loaded to the maximum loading limit; examination of partially-filled fuel storage tanks may be accepted alongside a review of records of periodic cold spot examinations carried out by suitably trained and qualified crew.

24.5.5 For Type B fuel storage tanks where the insulation arrangements are such that the insulation cannot be examined, the surrounding structures of wing tanks, double bottom tanks and cofferdams are to be visually examined for cold spots. This examination is to be carried out with the fuel storage tanks loaded. Ideally fuel storage tanks should shall be loaded to the maximum loading limit; examination of partially-filled fuel storage tanks may be accepted alongside a review of records of periodic cold spot examinations carried out by suitable trained and qualified crew.

24.5.7 The fuel storage hold space is to be generally examined.

24.5.8 The tank connection space is to be internally examined.

24.5.9 Tank and relief valves are to be externally examined.

24.5.10 Satisfactory operation of the tank monitoring system is to be verified.

24.5.11 Bilge alarms and means of drainage of the space are to be examined and tested.

24.5.12 Remote and local closing of the main tank valve is to be tested.

24.6 Annual Survey - Fuel Bunkering System

24.6.2 Bunkering operations are to be observed as far as possible practicable; satisfactory condition of the bunkering control, alert and safety system is to be verified. During annual survey it is not expected that ESD1 (stoppage of bunker transfer) or ESD2 (disconnection of bunker piping) will be operationally tested where applicable but records of maintenance and testing are to be reviewed. However, prior to starting the bunkering operation, it is expected that an ESD1 is tested with no LNG fuel in the system (i.e. a dry test). Records of the testing are to be available during survey.

24.7 Intermediate Surveys

(Part only shown)

24.7.1 In addition to the requirements below, the requirements of Pt 1, Ch 3, 24.1 General to Pt 1, Ch 3, 24.6 Annual Survey - Fuel Bunkering System are to be complied with.

- (b) A General Examination within the areas deemed as hazardous, such as bunker stations, vent mast area, tank connection space and spaces adjacent to vent arrangements from the tank connection space (if applicable), to verify the electrical arrangements have been maintained satisfactorily for operation in a hazardous environment. Gas detectors, temperature sensors, pressure sensors, level indicators, and other equipment providing input to the safety system are to be randomly tested to confirm satisfactory operating condition. The proper response of the safety system upon fault conditions is to be verified.
- (c) Verification that piping and independent fuel storage tanks are electrically bonded to the hull.

24.8 Complete Surveys – General requirements

(Part only shown)

24.8.6 The NDT testing requirements for different types of independent fuel storage tanks are detailed below; where radiographic or ultrasonic testing is required, at least 10 per cent of the length of the applicable welded connections is to be tested. This testing is to be carried out internally and externally as applicable. Insulation is to be removed as necessary for the required non-destructive testing:

- (d) At each alternate Complete Survey (i.e. at 10 year intervals); non-vacuum insulated independent fuel storage tanks of Type C are to be either:
 - II. Subject to a thorough, planned, non-destructive testing. This testing is to be carried out in accordance with a test schedule specially prepared for the tank design. If a special programme does not exist, the following should shall be tested:

24.8.8 Fuel bunkering, supply and storage tank pipe connections and fittings are to be examined, and all valves and cocks in direct communication with the interiors of the storage tanks are to be opened out for inspection and the connection pipes are to be examined internally, so far as practicable. Special attention is to be paid to the fuel storage tank master isolation valve(s); the valve seat is to be visually examined and the valve tested at the maximum working pressure of the fuel storage tank prior to re-commissioning the fuel system installation.

24.8.9 All emergency shutdown valves, check valves, block and bleed valves, master gas valves, remote operating valves, isolating valves for pressure relief valves in the fuel storage, fuel bunkering, and fuel supply piping systems are to be examined and proven operable. A random selection of valves is to be opened for examination.

24.8.9 24.8.10 Relief valves are to be surveyed as follows:

- (a) The pressure relief valves for the fuel storage tanks are to be opened for examination, adjusted to the correct operating pressure as indicated in *Pt 1, Ch 3, 24.8 Complete Surveys – General requirements 24.8.9.* (b) *Pt 1, Ch 3, 24.8 Complete Surveys – General requirements 24.8.10(b)*, function-tested, and sealed. If the tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, such non-metallic membranes are to be replaced. Valves may be removed from the tank for the purpose of making this adjustment under pressure of air or other suitable gas. ~~If valves are removed, the tank and fuel piping downstream of the tank isolation valves are to be gas freed and inerted.~~
- (b) Valves are to lift at a pressure not more than the percentage given below, above the maximum vapour pressure for which the tanks have been approved:
- For 0 to 1,5 bar, 10 per cent.
 - For 1,5 to 3,0 bar, 6 per cent.
 - For pressures exceeding 3,0 bar, 3 per cent.
- (c) Pressure relief valves for the fuel supply and bunkering piping are to be opened for examination, adjusted, and function tested. Where a detailed record of continuous overhaul and retesting of individually-identifiable relief valves is maintained, consideration will be given to acceptance on the basis of opening, internal examination, and testing of a representative sampling of valves, including each size and type of liquefied gas or vapour relief valve in use, provided there is logbook evidence that the remaining valves have been overhauled and tested since the previous Complete Survey.
- (d) Relief valves on fuel piping are to have their pressure settings checked. The valves may be removed from the piping for this purpose. At the Surveyor's discretion a sample of each size and type of valve may be opened for examination and testing.
- (e) The pressure/vacuum relief valves, rupture discs and other pressure relief devices for interbarrier spaces and hold spaces are to be opened, examined, tested and readjusted as necessary, depending on their design.

Existing paragraph 24.8.10 has been renumbered 24.8.11.

24.8.12 Compressors, process pressure vessels, heat exchangers and other components used in connection with fuel handling are to be examined.

24.8.14 24.8.13 Piping for the fuel processing system including valves, actuators and compensators is to be opened for examination. Insulation may need to be removed, as deemed necessary, to ascertain the condition of the piping. If any doubt exists regarding the integrity of the piping based upon visual examination then, where deemed necessary by the Surveyor, a pressure test at 1,25 times MARVS of the piping is to be carried out. The complete piping systems are to be tested for leaks after re-assembly. Where water cannot be tolerated and the piping cannot be dried prior to putting the system into service, the Surveyor shall accept alternative testing fluids or alternative means of testing.

Existing paragraphs 24.8.12 to 24.8.16 have been renumbered 24.8.14 to 24.8.18.

24.8.19 Examination of electrical equipment to include the physical condition of electrical cables and supports, intrinsically safe, explosion proof, or any other increased safety features on the electrical equipment.

24.8.20 Functional testing of the equipment which is necessary to establish and maintain the pressure within pressurised electrical equipment enclosures (Ex p) and associated alarms is to be carried out.

24.8.21 Testing of arrangements for de-energizing electrical equipment which is not certified for use in hazardous areas.

24.8.17 24.8.22 An electrical insulation resistance test of the circuits terminating in, or passing through, hazardous areas, is to be carried out. If the ship is not in a gas-free condition, the results of previously recorded test readings may be accepted together with a review of the on-board monitoring of the earth loop impedance of relevant circuits.

24.8.23 Gas detectors, temperature sensors, pressure sensors, level indicators, and other equipment providing input to the fuel safety system are to be tested to confirm satisfactory operating condition. Pressure, temperature and level indicating equipment are to be calibrated in accordance with the manufacturer's requirements.

24.9 Complete Surveys – Natural gas fuelled consumers Consumers and other equipment

24.9.4 All alarms associated with the natural gas fuel burning systems are to be verified; including, but not limited to, main and auxiliary engines, boilers, incinerators

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